ON THE CONSTRUCTION OF FLUES, &c.

By J. Sylvester, Esq.

To remedy the evils attendant upon the ordinary construction of flues, fire-places, and grates, Mr. Sylvester proposes to build every flue perfectly vertical; each flue for every fire-place, in all the stories, not only to ascend to the chimney-top on the outside, but to be continued down into the basement in lines parallel to each other from top to bottom, the fire-places or grates not being *under* the flues, but projecting in front of the chimney breast. The smoke from the fire is made to pass through an aperture into the flue at the back, which opening can, when the fire is not in use, be closed by an air-tight sliding door, while another, opening into the flue under the fire-grate, allows the ashes, dust, and other residue from the fire, to be cleared away into the descending or tail-flue, whence it falls to the bottom thereof in the basement story.

The flues being built perfectly straight and smooth, all lodgment of soot is prevented, and, consequently, the evils attendant on the contraction of the flue and falling of dirty matter into the apartment, have no longer existence, while the defective action of the chimneys, arising from this cause, is, as a necessary consequence, done away with.

This concerns the flue considered as a means of carrying away the smoke, and causing the perfect action of the fire; but an equal, if not a greater advantage consists in doing away with the necessity of sweeping each flue into the fire-place of the room it belongs to, with the accompanying evil of a long preparation of the room by taking up carpets, covering furniture and books, removing ornaments, &c., &c., to the great destruction of comfort and loss of time.

All these formidable evils are completely avoided, since by this means it is merely necessary when a chimney requires sweeping to close the door at the top of the grate with which the flue communicates, and the sweep may go into the basement story, open the door at the bottom of the tail or descending flue, and take away the soot and ashes there collected. He may then, by the use of the machine, since climbing boys are no longer permitted, brush down, from top to bottom, any small portions of soot that may hang to the flue, when the whole can be removed without the slightest interference with the room to which the flue belongs. The whole of the flues in a stack may be swept at the same time with as little inconvenience as *one*, since they all descend into one chamber and open at the same level.

It is worthy of remark that the flues being quite straight,

there are no shoulders, as in tortuous flues, for the soot to lodge upon, and, consequently, the operation of sweeping will not be required *nearly so often* as with the ordinary chimneys, and the removal of ashes may take place at any distant intervals of time, instead of two or three times a-day ; for instead of the ashes being carried through the rooms, they are made to descend the tail-flue, and are thence carried away with the soot.

ON KEENE'S MARBLE CEMENT.

By G. F. White, Esq.

The composition denominated Keene's marble cement, from its novelty and valuable qualities, whether for strictly useful or for decorative purposes, seems to afford advantages which are not supplied by any analogous material in use at the present time.

A cement, having for one of its ingredients marble dust, was, as is well known, used by the ancients for coating the walls and columns of their edifices, and which, in Italy and other genial climates, though exposed to the external air, was found to be by no means inferior in durability to the native marble. But while Keene's cement bears a relation to the ancient stucco in hardness and some other respects, the resemblance does not extend further, as marble does not enter into its composition, neither is it adapted for exterior or hydraulic purposes.

The component parts of Keene's cement are sulphate of lime or gypsum, and sulphate of alumina or alum. The former is, as in the case of plaster, deprived of its water of crystallisation by being baked, and then steeped in a solution of alum-water of given strength ; then, by a second process, of being subjected to intense heat, the properties of the two compounds become so intimately mixed and exchanged, that the result is a cement unequalled in hardness and in the delicacy of its nature.

The finer kind of this cement is susceptible of a beautiful polish, and very nearly approaches the appearance of statuary marble. The same degree of hardness and lustre can be obtained in any tint which may desired; and the fact, that the sulphate of lime is the base on which most colours are struck, and that alum is used as a mordant to fix them, affords sufficient proof of its aptitude for the imitation of any description of coloured marble or granite.